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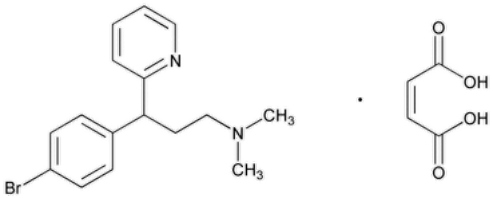
Brompheniramine Maleate



$C_{16}H_{19}BrN_2 \cdot C_4H_4O_4$ 435.31

2-Pyridinepropanamine, γ-(4-bromophenyl)-*N*,*N*-dimethyl-, (±)-, (*Z*)-2-butenedioate (1:1);

(±)-2-*p*-Bromo-α-2-(dimethylamino)ethylbenzylpyridine maleate (1:1) CAS RN®: 980-71-2; UNII: IXA7C9ZN03.

DEFINITION

Brompheniramine Maleate, dried at 105° for 3 h, contains NLT 98.0% and NMT 102.0% of brompheniramine maleate ($C_{16}H_{19}BrN_2 \cdot C_4H_4O_4$).

IDENTIFICATION

• **A.** **Spectroscopic Identification Tests ⟨197⟩, *Infrared Spectroscopy*: 197K**

• **B.** The retention times of the maleic acid and brompheniramine peaks of the *Sample solution* correspond to those of the *Standard solution*, as obtained in the *Assay*.

ASSAY

• **Procedure**

Solution A: 5.44 g/L of monobasic potassium phosphate. Adjust with phosphoric acid to a pH of 3.0 ± 0.1.

Solution B: Acetonitrile

Mobile phase: See *Table 1*.

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	95	5
1	95	5
20	70	30
30	70	30
31	95	5
40	95	5

Diluent: Acetonitrile and *Solution A* (5:95)

System suitability stock solution: 0.02 mg/mL each of USP Pheniramine Maleate RS, USP Chlorpheniramine Maleate RS, and USP Chlorpheniramine Related Compound B RS in *Diluent*. Sonicate for 1 min.

System suitability solution: 0.5 mg/mL of USP Brompheniramine Maleate RS and 2 µg/mL each of USP Pheniramine Maleate RS, USP Chlorpheniramine Maleate RS, and USP Chlorpheniramine Related Compound B RS in *Diluent*, prepared as follows. Transfer 5.0 mg of USP Brompheniramine Maleate RS to a 10-mL volumetric flask, add 5.0 mL of *Diluent*, and 1.0 mL of the *System suitability stock solution*, and dilute with *Diluent* to volume.

Standard solution: 0.5 mg/mL of USP Brompheniramine Maleate RS in *Diluent*. Sonicate for 1 min.

Sample solution: 0.5 mg/mL of Brompheniramine Maleate in *Diluent*. Sonicate for 1 min.

Chromatographic system

(See *Chromatography ⟨621⟩, System Suitability*.)

Mode: LC

Detector: UV 225 nm

Column: 4.6-mm × 25-cm; 5-µm packing L1

Column temperature: 30°

Flow rate: 1 mL/min

Injection volume: 10 µL

System suitability

[NOTE—The relative retention times for maleic acid and brompheniramine are 0.18 and 1.0, respectively.]

Samples: *System suitability solution* and *Standard solution*

Suitability requirements

Resolution: NLT 1.5 between chlorpheniramine and brompheniramine; and NLT 2.0 between chlorpheniramine related compound B and pheniramine, *System suitability solution*

Tailing factor: NMT 2.0 for brompheniramine, *Standard solution*

Relative standard deviation: NMT 0.73%, *Standard solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of brompheniramine maleate ($C_{16}H_{19}BrN_2 \cdot C_4H_4O_4$) in the portion of Brompheniramine Maleate taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times 100$$

r_U = peak response of brompheniramine from the *Sample solution*

r_S = peak response of brompheniramine from the *Standard solution*

C_S = concentration of USP Brompheniramine Maleate RS in the *Standard solution* (mg/mL)

C_U = concentration of Brompheniramine Maleate in the *Sample solution* (mg/mL)

Acceptance criteria: NLT 98.0%–NMT 102.0% on the previously dried basis

IMPURITIES

- **RESIDUE ON IGNITION ⟨281⟩:** NMT 0.2%
- **ORGANIC IMPURITIES**

Solution A, Solution B, Diluent, Mobile phase, System suitability solution, and **Chromatographic system:** Proceed as directed in the *Assay*.

Standard solution: 2.7 µg/mL of USP Brompheniramine Maleate RS in *Diluent*, equivalent to 2.0 µg/mL of brompheniramine. Sonicate 1 min.

Sensitivity solution: 0.74 µg/mL of USP Pheniramine Maleate RS in *Diluent*

Sample solution: 0.5 mg/mL of Brompheniramine Maleate in *Diluent*. Sonicate for 1 min.

System suitability

Samples: *System suitability solution*, *Standard solution*, and *Sensitivity solution*

Suitability requirements

Resolution: NLT 1.5 between chlorpheniramine and brompheniramine; and NLT 2.0 between chlorpheniramine related compound B and pheniramine, *System suitability solution*

Signal-to-noise ratio: NLT 10 for pheniramine, *Sensitivity solution*

Relative standard deviation: NMT 5.0% for brompheniramine, *Standard solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of each impurity in the portion of Brompheniramine Maleate taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times (1/F) \times 100$$

r_U = peak response of each impurity from the *Sample solution*

r_S = peak response of brompheniramine from the *Standard solution*

C_S = concentration of brompheniramine in the *Standard solution* (mg/mL)

C_U = concentration of Brompheniramine Maleate in the *Sample solution* (mg/mL)

F = relative response factor (see *Table 2*)

Acceptance criteria: See *Table 2*. Disregard any peak having areas less than 0.05% of brompheniramine.

Table 2

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
Maleic acid[a]	0.18	—	—
Chlorpheniramine related compound B[b]	0.46	—	—
Pheniramine	0.53	0.45	0.4
Chlorpheniramine	0.94	1.1	0.4
Brompheniramine	1.0	—	—
Any other unspecified impurity	—	1.0	0.10
Total impurities	—	—	1

[a] Salt counter ion is included in the table for identification purposes only.

[b] Di(pyridin-2-yl)amine. Used only to establish the system suitability.

SPECIFIC TESTS

Change to read:

- ▲**Optical Rotation** ⟨781A⟩, *Angular Rotation*▲ (ERR 1-May-2024)

  Sample: 100 mg/mL in water at 20°

  Acceptance criteria: −0.2° to +0.2°, measured in a 20-cm tube
- **pH** ⟨791⟩

  Sample: 10 mg/mL

  Acceptance criteria: 4.0–5.0
- **Loss on Drying** ⟨731⟩

  Analysis: Dry at 105° for 3 h.

  Acceptance criteria: NMT 0.5%

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in tight, light-resistant containers.
- **USP Reference Standards** ⟨11⟩

  USP Brompheniramine Maleate RS

  USP Chlorpheniramine Maleate RS

  USP Chlorpheniramine Related Compound B RS

  Di(pyridin-2-yl)amine.

  $C_{10}H_9N_3$ 171.20

  USP Pheniramine Maleate RS

Auxiliary Information - Please check for your question in the FAQs before contacting USP.

Topic/Question	Contact	Expert Committee
BROMPHENIRAMINE MALEATE	Documentary Standards Support	SM52020 Small Molecules 5

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
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